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10/067,920	02/08/2002	Takayuki Sugahara	0102/0196	8965

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EXAMINER	
KRONENTHAL, CRAIG W	
ART UNIT	**PAPER NUMBER**
2623	

DATE MAILED: 03/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/067,920	SUGAHARA ET AL.	
	Examiner	Art Unit	
	Craig W Kronenthal	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/8/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-7, 9-11, and 13-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Numao et al. (PN 6,055,321). (hereinafter Numao)

Regarding Claim 1: Numao discloses an apparatus for embedding a watermark into contents data, comprising:

- Parameter converting means for converting a parameter of first contents data to generate second contents data [The first contents data is represented by the media, such as an image (I) (col. 6 lines 31-36). The parameter being the size of the image. The image is converted to an array M[p], which represents second contents data by extracting (Fig. 6, 200) media array values (M[i]) in positions corresponding to the position sequence (p) (col. 10 lines 10-13). The resulting media array M[p] has less than or equal to the number of elements as M[i].];
- Mixing means (Fig. 6, 400) for embedding parameter information into the second contents data as watermark information, the parameter information representing

a condition of the conversion of the parameter by the parameter converting means (col. 10 lines 50-52) [The hiding position translation function (SK) has the following inputs: state sequence (S) (which is a function of the position sequence, p), message (m), and media (M). This function acts to mix these inputs according to Equation 12. The state sequence (S) because it's a function of the position sequence is therefore a condition of the conversion.].

The analogous arguments of claim 1 are applicable to claim 9.

Regarding Claim 2: Numao discloses an apparatus as recited in claim 1, wherein the parameter converting means comprises means for converting a parameter of segments of the first contents data which correspond to pixels forming a specified picture portion [The first contents data represented by an image (I) is divided into regions. These regions represent pixels forming a specified picture portion. The regions have corresponding values in a media array (M[i]), which represents the segments of the first contents data (col. 6 lines 31-36). The converting means (Fig. 6, 200) converts the media array M[i] into the second contents data, media array (M[p]).].

Regarding Claim 3: Numao discloses an apparatus as recited in claim 1, wherein the mixing means comprises means for embedding copyright information and the parameter information into the second contents data as watermark information [The mixing means (Fig. 6, 400) in addition to embedding the parameter information as explained in claim 1, embeds a message array (m) (col. 10 lines 50-52). This message array contains

message data that acts as copyright information, such as information on the producer of the image (col. 6 lines 50-51). The analogous arguments of claim 3 are applicable to claim 11.].

Regarding Claim 4: Numao discloses an apparatus as recited in claim 1, wherein the parameter converting means comprises:

- Means for converting a parameter of segments of the first contents data which correspond to pixels at watermark-embedded positions, and the parameter information includes a parameter value indicative of a rate of the conversion of the parameter [The state sequence (S), which represents the parameter information as explained with regards to claim 1, contains values that indicate the next stage where watermark data is hidden (col. 7 lines 2-3). Therefore each value can be considered a rate of conversion for informing the watermark data detector how much of the original media array was skipped when embedding.],

wherein the mixing means comprises a first mixer and a second mixer, wherein the first mixer comprises:

- Pattern generating (Fig. 6, 100) means for generating bits representing a predetermined bit pattern [The state sequence (S) represents a pattern generated to determine the locations subject to hiding watermark bits (col. 7 lines 2-11).],
- Specified-bit detecting (Fig. 6, 200) means for detecting bits in the second contents data as specified bits which correspond to the pixels at the watermark-

embedded positions [The pixel value extraction step obtains the bits in the second contents data represented by the values in the array of M[p] (col. 10 lines 10-13).],

- Calculating (Fig. 6, 300) means for calculating a desired bit pattern represented by the specified bits in response to the predetermined bit pattern and a specified bit pattern [The hiding position translation function is used to calculate the next state based on a state value (Sj-1) and Media array value (M[pj-1]) (col. 10 lines 50-52). This next state is then used to calculate the desired bit pattern represented as the position sequence (see Equation 12).],
- Changing means (Fig. 6, 400) for changing the specified bits to represent the desired bit pattern to convert the second contents data into bit-pattern-added contents data [The embedding step converts the second contents data (M[p]) into bit pattern-added contents data (hiding array, Mm[p]) (col. 11 lines 7-9).],

wherein the second mixer comprises:

- Means for embedding (Fig. 6, 400) copyright information and the parameter information into the bit-pattern-added contents data as watermark information [The copyright information (message array (m)) is embedded into the Media array (M[p]) which represents the bit pattern added contents and has hidden parameter information (state sequence (S)). The result of this embedding is the media array after hiding (M'[p]) (col. 11 lines 43-57).].

The analogous arguments of claim 4 are applicable to claim 10.

Regarding Claim 5: Numao discloses an apparatus for reproducing a watermark (Fig. 8) from watermarked contents data (M'[p]) generated by converting a parameter of original contents data to get conversion-resultant original data and embedding parameter information into the conversion-resultant original data as watermark information, the parameter information representing a condition of the conversion of the parameter, the apparatus comprising (see analogous arguments made in claim 4 regarding the generation of watermark contents data):

- Parameter detecting (Fig. 8, 110) means for detecting the parameter information from the watermarked contents data [The final state Sj is detected as the parameter information (col. 13 lines 45-47).];
- Parameter inversely converting (Fig. 8, 130) means for inversely converting the watermarked contents data into the original contents data in response to the parameter information detected by the parameter detecting means [The equation PK is the inverse of the equation SK and is used, based on the value of Sj detected, to extract the watermark information (col. 14 lines 10-14).].

Regarding Claim 6: Numao discloses an apparatus as recited in claim 5, wherein the watermarked contents data include copyright information and the parameter information as the watermark information, and further comprising copyright information detecting means for detecting the copyright information from the watermarked contents data [The analogous arguments of claim 3, regarding watermark information including the copyright information and parameter information, are applicable to claim 6. The

copyright detecting means is represented by the message calculation (Fig. 8, 140) (col. 14 lines 20-24).].

Regarding Claim 7: Numao discloses an apparatus as recited in claim 5, wherein the watermarked contents data have been generated by converting a parameter of segments of the original contents data which correspond to pixels at watermark-embedded positions, and the parameter information includes a parameter value indicative of a ratio of the conversion of the parameter, wherein the parameter detecting means comprises pattern generating means for generating bits representing a predetermined bit pattern, operation means for selecting specified bits among bits in the watermarked contents data, for repetitively changing the currently-selected specified bits from ones to others, and for executing given logical operation between the predetermined bit pattern and a bit pattern represented by the currently-selected specified bits, embedding-position detecting means for deciding whether or not a result of the given logical operation is equal to a specified bit pattern, and for, when the result of the given logical operation is equal to the specified bit pattern, deciding that the currently-selected specified bits correspond to a watermark-embedded position, and parameter-value detecting means for detecting the parameter value in the detected parameter information, wherein the parameter inversely converting means comprises an inverse converter for, in response to the parameter value detected by the parameter-value detecting means, inversely converting the parameter of the segments of the watermarked contents data which correspond to the pixels at the watermark-embedded

positions decided by the embedding-position detecting means [It is well known in the art of watermark detection to perform the inverse functions of the embedding process. Therefore, it is inherent that the detection process be the inverse equivalent of the embedding process as outlined in claim 4.].

Regarding Claim 13: Numao discloses an apparatus for embedding a watermark into contents data, comprising:

- Address generating (Fig. 6, 100) means for generating a jump-destination address (col. 7 lines 16-17) [The addresses are the elements of the position sequence, which is determined by Equation 6. This position sequence elements may point to any position within the media content, as shown in Figure 5, and therefore act as a jump address. For example the position P1 acts as jump address indicating the destination position P2.];
- Information generating (Fig. 6, 100) means for generating copyright information (col. 6 lines 50-51) [A message array is generated, which contains message data such as information on the producer of the image and date of the image. This information is the copyright information.];
- Mixing (Fig. 6, 400) means for embedding the jump-destination address (position sequence, p) generated by the address generating means and the copyright information (message array, m) generated by the information generating means into input contents data (media array, M) as watermark information to generate first watermark-added contents data (col. 10 lines 50-52) [The hiding position

translation function (SK) has the following inputs: state sequence (S) (which is a function of the position sequence, p), message (m), and media (M). This function acts to mix these inputs according to Equation 12.];

- Rearranging (Fig. 6, 400) means for rearranging unit portions of the watermark-added contents data generated by the mixing means in response to the jump-destination address generated by the address generating means, wherein the unit portions represent respective divided regions composing a still-picture frame (col. 11 lines 18-21) [The unit portions are represented by the positions (p_j), which are image regions (col. 7 lines 29-31). The rearranged unit portions of the watermark-added contents data are represented by the hiding array (Mm). This array contains only values of the media array (M) containing parts of the message (m), thereby jumping parts of the image (M) without the message (m) in response to the positions (p_j).].

Regarding Claim 14: Numao discloses an apparatus for reproducing a watermark from watermarked contents data, comprising:

- Rearranging (Fig. 8, 120) means for rearranging unit portions of first watermark-added contents data in an original order to generate second watermark-added contents data in response to a jump-destination address (col. 13 lines 57-59) [The positions (p_j) represent the unit portions of first watermark-added contents data, which is signified by M'[p_j]. The units are rearranged in response to the jump-destination address forming the second watermark-added contents data

represented by the hiding array (Mm[J-1]). This hiding array (Mm[J-1]) jumps the parts of the watermarked image/media (M'[p_j]) that do not contain the message (m).];

- Watermark information detecting (Fig. 8, 140) means for detecting watermark information from the second watermark-added contents information (col. 14 lines 20-22) [The message array (m) is the watermark information.];
- Address calculating (Fig. 8, 110) means for calculating the jump-destination address (p_j) from a related portion of the watermark information detected by the watermark information detecting means, and for notifying the calculated jump-destination address to the rearranging means (col. 45-48) [The initial state value calculation step (110) determines the p_j, which represent the jump-destination addresses that allow the watermark decoding to skip over parts of the image not containing watermark data. The determined positions/addresses are provided to the extractor/rearranging means (120), so that the watermark information can be decoded in sequence.];
- A decoder for decoding the second watermark-added contents [The analogous arguments applied to the watermark information detecting (140) means above is applicable to this decoder.];
- Copyright information detecting means for detecting copyright information from the watermark information detected by the watermark information detecting means [The analogous arguments applied to the watermark information detecting (140) means above is applicable to this copyright information detecting

means. The watermark information is copyright information and is represented by the message array (m) in Numao.].

The analogous arguments made regarding claim 14 are applicable to claim 15.

Regarding Claim 16: Numao discloses a recording medium for storing watermarked data including contents data and watermark information, the contents data resulting from a prescribed encoding procedure, the watermark information being embedded in the contents data, the watermark information including a jump-destination address and copyright information, the contents data having unit portions arranged in a scrambled order different from an original order, the unit portions being defined by the prescribed encoding procedure, the jump-destination address being for enabling the unit portions to be rearranged in the original order [The analogous arguments made regarding claim 13, concerning the embedding process and jump-destination addresses, are applicable to claim 16 and 17. Additionally, with regards to claim 16, the contents data or media array (M) is composed of divided regions of an image (col. 6 lines 32-33). The prescribed encoding is understood to be the image conversion into array values representing the intensities of the regions. The values may be located anywhere within the array and therefore the contents data unit portions may be considered scrambled (col. 6 lines 34-37).].

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numao.

Regarding Claim 8: Numao discloses an apparatus as recited in claim 7, wherein the predetermined bit pattern and the specified bit pattern remain unchanged when being rotated through one of 90, 180, and 270 degrees [The examiner takes official notice that it is common to use bit patterns that can be rotated without change through one of 90, 180, and 270 degrees to assist the detection process in locating the embedded watermark information. One of ordinary skill in the art would be motivated to use similar patterns to those exhibited in Figures 8 and 9 as a faster alternative to registration methods also commonly used to adjust for rotation.].

Regarding Claim 12: Numao discloses an apparatus for embedding a watermark into contents data, comprising:

- Address generating (Fig. 6, 100) means for generating a jump-destination address (col. 7 lines 16-17) [The addresses are the elements of the position

sequence, which is determined by Equation 6. This position sequence elements may point to any position within the media content, as shown in Figure 5, and therefore act as a jump address. For example the position P1 acts as jump address indicating the destination position P2.];

- Information generating (Fig. 6, 100) means for generating copyright information (col. 6 lines 50-51) [A message array is generated, which contains message data such as information on the producer of the image and date of the image. This information is the copyright information.];
- Mixing (Fig. 6, 400) means for embedding the jump-destination address (position sequence, p) generated by the address generating means and the copyright information (message array, m) generated by the information generating means into input contents data (media array, M) as watermark information to generate first watermark-added contents data (col. 10 lines 50-52) [The hiding position translation function (SK) has the following inputs: state sequence (S) (which is a function of the position sequence, p), message (m), and media (M). This function acts to mix these inputs according to Equation 12.];
- Rearranging (Fig. 6, 400) means for rearranging unit portions of the second watermark-added contents data generated by the encoder in response to the jump-destination address generated by the address generating means, wherein the unit portions are defined by the encoding by the encoder (col. 11 lines 18-21) [The rearranged unit portions of the second watermark-added contents data is represented by the hiding array (Mm). This array contains only values of the

media array (M) containing parts of the message (m), thereby jumping parts of the image (M) without the message (m) in response to the positions (p_j).];

Numao does not disclose:

- An encoder for compressively encoding the first watermark-added contents data generated by the mixing means into second watermark-added contents data;

However, the examiner takes official notice that it would be obvious to modify Numao's embedding apparatus with a compression encoder because it is well known in the art. Despite not including a compression encoder, Numao does mention that its embedded message could be recovered from a compressed image, which indicates that compression might be used after embedding.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Ogawa et al. (PN 6,704,431) is cited for teaching the embedding of a modulation parameter and digital watermark sequence.
- Chen et al. (PN 6,671,387) is cited for teaching watermark insertion into selected addresses.
- Braudaway et al. (PN 5,825,892) is cited for teaching the embedding of modulation parameters.
- Rhoads (PN 6,122,403) is cited for teaching facilitating scale and rotation registration for steganographically embedded patterns.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig W Kronenthal whose telephone number is (703) 305-8696. The examiner can normally be reached on 8:00 am - 5:00 pm / Mon. - Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 306-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CWK
2/14/05

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